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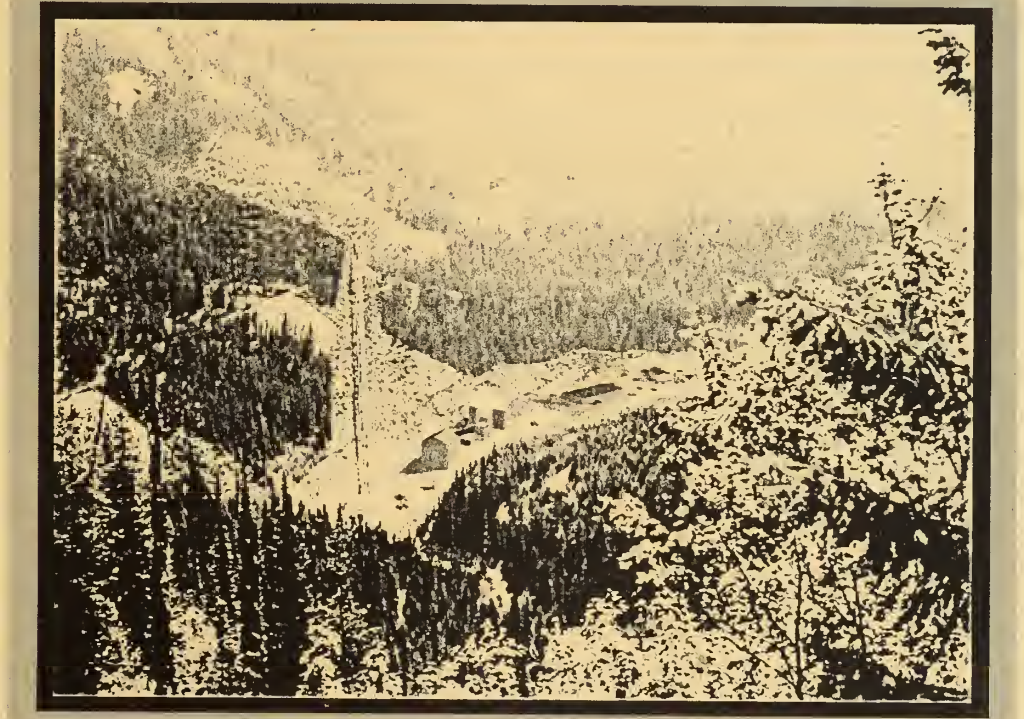
Montana. Dept. of Environmental Quality
Draft environmental impact statement ASARCO Rock Creek

Summary of the
Draft Environmental Impact Statement
ASARCO ROCK CREEK PROJECT



Prepared By:

Montana Department of Environmental Quality
and
U.S. Forest Service

July 1995

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Summary
of the
Draft Environmental Impact Statement

ASARCO, INCORPORATED'S ROCK CREEK PROJECT

July 1995

U. S. Forest Service
Kootenai National Forest

Rob L. Schrenk
Robert L. Schrenk, Forest Supervisor

Montana Department of
Environmental Quality

Mark Simonich
Mark Simonich, Director

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COVER SHEET

Type of Statement: Summary of the Draft Environmental Impact Statement

Proposed Action: Construction and operation of ASARCO, Incorporated's (ASARCO) Rock Creek Project

Lead Agencies:
Kootenai National Forest
Montana Department of State Lands (after July 1, 1995, part of Department of Environmental Quality)

Cooperating Agencies:
U.S. Army Corps of Engineers
U.S. Environmental Protection Agency
Idaho Department of Health and Welfare

Abstract:

The summary for the Rock Creek Project Draft Environmental Impact Statement describes the land, people, and resources potentially affected by the proposed Rock Creek copper/silver mine. The major federal and state action consists of the approval of all necessary permits to construct and operate the Rock Creek Project. The proposed project would consist of seven primary components: an underground mine, a mill, four adits and portals, a tailings impoundment, access roads, a 6.9-mile utility corridor, and a rail load-out. Four alternatives are analyzed in the summary of the draft EIS: a no-action alternative, ASARCO Incorporated's proposed action, the proposed action with mitigations, and a modified project with mitigations.

For Further Information, Please Contact:

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The following errata items include supplemental and corrected information pertaining to Aquatics/Fisheries and Biodiversity of Wildlife Habitat/Vegetation and Wildlife Species to include with the printed Summary of the draft EIS for the ASARCO Rock Creek Project. The agencies will incorporate these items into the Summary of the final EIS unless new information becomes available prior to completing the final document that changes the analyses.

Page S-12, under Issue 1, 1st bullet and under Issue 2, 4th bullet:

> *Replace the phrase*: "(alternatives II and III)" with "(all action alternatives)" *in both bullets.*

Page S-12, under Issue 2, 4th bullet:

> *Replace the phrases* "increased sediment" *with:* "reduced habitat quality" *and* "winter breeding" *with* "interbreeding."

Page S-12, under Issue 2, 3rd bullet:

> *Insert the phrase:* ", increased mortality risks, and population reduction" *before the phrase* "(all action alternatives)."

Page S-13, under Issue 3:

> *Replace the entire bullet with:* "surface water quality and aquatic life in lower Rock Creek, Clark Fork River, Cabinet Gorge Reservoir, and Lake Pend Oreille if failure occurred (all action alternatives)."

Page S-13, under Issue 5:

> *Replace entire bullet with:* "eliminate or reduce effectiveness of 91 to 208 acres of old growth (depending on the alternative) further reducing the percentage of old growth below biological levels recommended for long-term maintenance of old growth-associated species (all action alternatives)."

Page S-21, Table S-3 (Water Resources under Alternative II, 1st paragraph):

> *Replace with the following paragraph:*
>
> "Suspended sediment and nitrogen loads would be temporarily increased in Rock Creek and the West Fork during mine construction and nitrogen could impact aquatic invertebrates and algae in the short term."

Page S-21, Table S-3 (Water Resources under Alternative II, 2nd paragraph):

Replace the paragraph with the following paragraph:

"Impacts from materials from spills and pipeline ruptures potentially could affect water quality and aquatic life in Rock Creek and the Clark Fork River, including Cabinet Gorge Reservoir."

Page S-22, Table S-3 (Sensitive aquatic species under Alternative I, 2nd paragraph):

Replace the entire paragraph with the following paragraph:

"Aquatic resources would change over time due to natural cycles. Timber sale activities could impact aquatic resources. Bull and westslope cutthroat trout may continue to have a high risk of extinction."

Page S-22, Table S-3 (Sensitive aquatic species under Alternative III, 2nd paragraph):

Replace the entire paragraph with the following paragraph:

"Reduction of existing sediment sources in Rock Creek and Bull River drainages would reduce impacts to bull trout and cutthroat trout populations in Rock Creek and bull trout in Cabinet Gorge Reservoir, respectively."

Page S-22, Table S-3 (Sensitive aquatic species under Alternative IV, 1st paragraph):

Replace the paragraph with the following paragraph:

"Sediment impacts to bull and westslope cutthroat trout would be minimized in the West Fork of Rock Creek. The 300 ft. buffer around the confluence mill site would reduce sedimentation impacts downstream, although impacts to aquatic species may still be significant."

Page S-22, Table S-3 (Sensitive aquatic species under Alternative IV, 2nd paragraph):

Replace the paragraph with the following paragraph:

"Similar to Alternative III but 300-ft.
buffer around the confluence mill site
would further reduce suspended sediment
and associated impacts to bull and
cutthroat trout in mainstem Rock Creek
and bull trout in Cabinet Gorge Reservoir."

Page S-23, Table S-3, (Old Growth Ecosystems under title):

Delete the phrase: "(does not include replacement growth)."

Page S-23, Table S-3 (Old Growth Ecosystems under Alternative I, 2nd paragraph):

Delete the word: "viable."

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SUMMARY OF THE ASARCO ROCK CREEK PROJECT EIS

INTRODUCTION

This summary presents a condensed version of information contained in the draft ASARCO Rock Creek Mine Environmental Impact Statement (draft EIS). If interested in more detailed information, one may review the draft EIS. It can be obtained from one of the following people:

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(406) 293-6211

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A copy of the EIS can also be reviewed at the following locations:

Supervisor's Office, Kootenai National Forest, Libby, MT
Cabinet Ranger Station, Trout Creek, MT
U.S. Army Corps of Engineers, Helena, MT
Lincoln County Library, Libby, MT
Missoula City-County Library, Missoula, MT
East Bonner County Library, Sandpoint, ID
Thompson Falls Library, Thompson Falls, MT
Heron Library, Heron, MT
Mansfield Library, University of Montana, Missoula, MT

THE EIS AND PERMITTING PROCESS FOR THE ASARCO ROCK CREEK PROJECT

The ASARCO Rock Creek Project is a proposed underground copper and silver mine in northwestern Montana. The project is proposed and would be operated by ASARCO, Incorporated (ASARCO). The mine, mill, and other facilities would be located in Sanders County, Montana, near Noxon, Montana (see **Figure S-1**). ASARCO currently holds mineral rights under the Cabinet Mountains Wilderness (CMW). The purpose of the proposed action is to develop these interests. The project would include constructing a mill for ore processing and associated mine waste disposal facilities. A rail load-out for transportation of concentrate, and water treatment facilities would also be built.

Procedures governing the EIS analysis process in Montana are defined in administrative rules implementing the National Environmental Policy Act (NEPA) and the Montana Environmental Policy Act (MEPA). These laws require an EIS to be prepared if any action taken by the State of Montana or the U.S. Forest Service may significantly affect the quality of the human environment (as defined in NEPA and MEPA). The draft EIS was written to meet the requirements of these statutes and the administrative rules and regulations implementing these laws adopted by participating state or federal agencies.

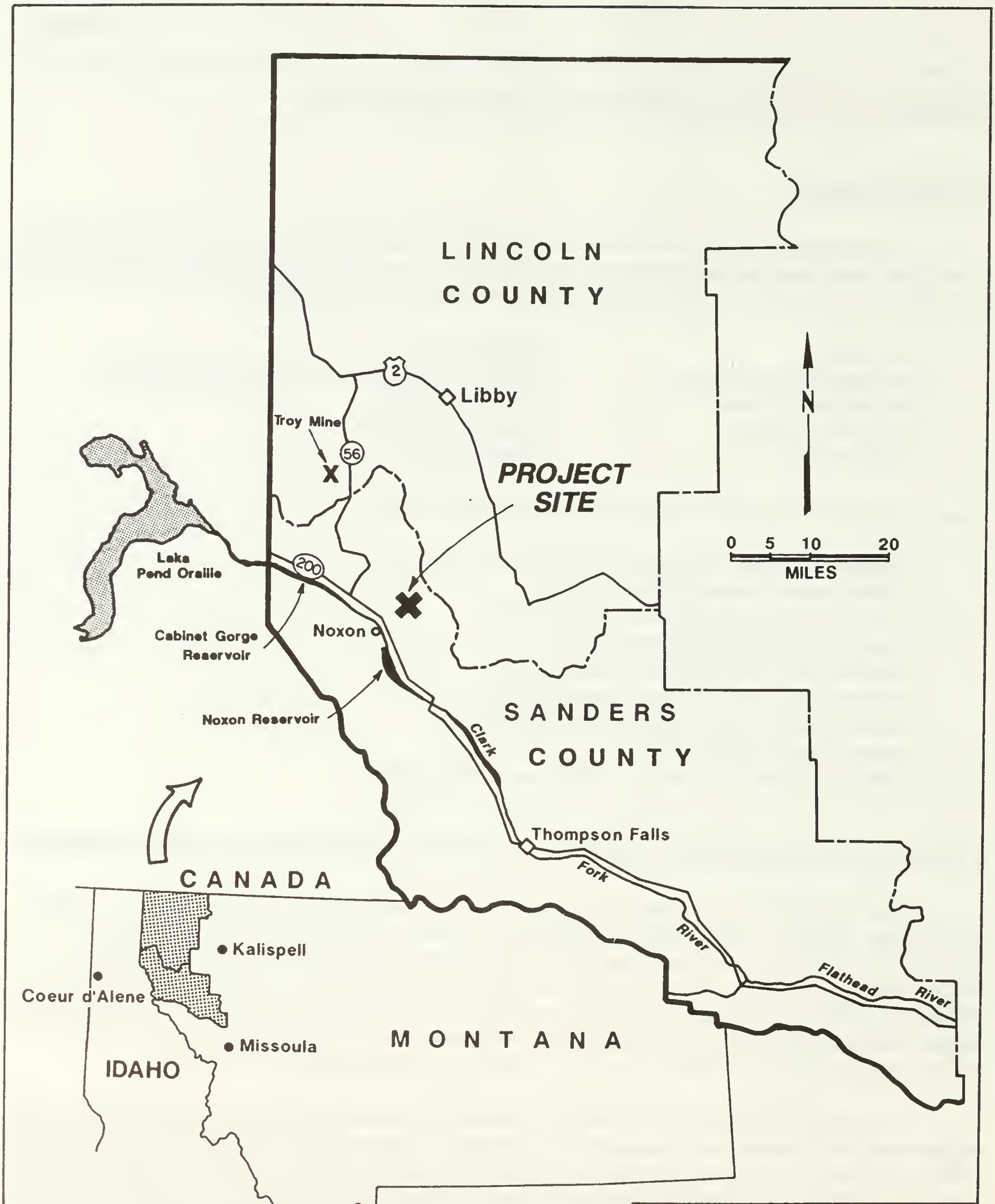

FIGURE S-1
Location Map
Rock Creek Project
Sanders County, Montana

During the preparation of this draft EIS, the Montana Legislature created a new Department of Environmental Quality, integrating portions of DSL and Department of Health and Environmental Sciences (DHES) into the new department. Hereinafter, whenever DSL and DHES are referred to, it should be noted that after July 1, 1995, these references pertain to the new department.

Two governmental agencies serve as lead agencies for this EIS: Kootenai National Forest (KNF) and Montana Department of State Lands (DSL). The EIS was prepared in response to applications to operate the ASARCO Rock Creek Mine submitted to KNF and DSL. Two other agencies will use this EIS to make decisions on permits they issue. Montana Department of Health and Environmental Sciences (DHES) will decide on ASARCO's Montana Pollutant Discharge Elimination System (MPDES) permit. The U.S. Army Corps of Engineers (COE) will make a determination on ASARCO's 404 permit.

The scope of the draft EIS includes actions, alternatives, and analyses that would be considered in separate EISs required by each agency in order to fulfill its regulatory responsibilities. Preparation of a single draft EIS for the Rock Creek Project provides a coordinated and comprehensive analysis of potential environmental impacts. The decision to be made by each agency is to grant or deny the necessary permits or approvals for ASARCO to operate the Rock Creek Project. Permitting decisions will be based on the environmental effects and consequences relative to legal standards as documented in this EIS, along with other information presented during agency decision-making processes. In addition, this information will be used to determine the conditions necessary to operate the project, if approved.

DEVELOPMENT OF ALTERNATIVES

Under NEPA and MEPA regulations, the lead agencies are required to consider the environmental effects of a proposed action and of reasonable alternatives to that action. Two alternatives that must be considered in the EIS are the proposed action -- construction, operation and reclamation of the Rock Creek Project -- and the no-action alternative, or denial of permits and approvals. Other alternatives are developed through public participation and identification of significant issues.

Public participation has been a key element in preparing this draft EIS (see **Table S-1**). The first opportunity for public involvement occurred in the beginning of the EIS process when "scoping" was conducted. Scoping is a process designed to identify a broad list of environmental issues related to the proposed action. Scoping was again conducted when preparation of the EIS was resumed after a 4-year lapse. The agencies determined the significant issues from those identified during the two scoping periods. The subsequent analyses presented in the EIS focused on identified significant issues.

TABLE S-1. Public Meetings

May 26, 1987	Public information meeting held on ASARCO's application in Noxon, Montana.
January 27, 1988	Public scoping meeting on ASARCO's application at Noxon, Montana.
March 22, 1990	Public meeting on ASARCO's petition to amend ambient water quality at Noxon, Montana.
June 16, 1993	Public scoping meeting in Noxon, Montana.
June 28, 1993	Public scoping meeting in Sandpoint, Idaho.

Based on the range of environmental issues identified by the public during scoping and analysis by DSL and KNF, eight significant issues drove the development of alternatives and evaluation of impacts:

Issue 1: Effects on quantity and quality of Montana and Idaho surface and ground water resources;

Issue 2: Effects on fish and wildlife habitat and current and proposed threatened and endangered species;

Issue 3: Stability of the tailings impoundment;

Issue 4: Impacts to socioeconomics of the surrounding communities;

Issue 5: Potential effects on old growth ecosystems;

Issue 6: Effects on Waters of the U.S. and wetlands;

Issue 7: Effects on public access and traffic safety; and

Issue 8: Effects on aesthetic quality, including noise, scenic, and wilderness experiences.

Several alternatives were evaluated by ASARCO and the agencies but dismissed from detailed analysis in the draft EIS. These alternatives were either technically or economically infeasible, resulted in greater environmental effects, were beyond the ability of the lead agencies to implement, or offered no advantages to alternatives considered in detail. The range of alternatives considered but dismissed includes:

- mill and mine portal siting alternatives;
- tailings impoundment siting and construction methods;
- a McKay Creek impoundment alternative;
- a McKay Creek water retention dam;
- other tailings disposal methods, including backfilling;
- rail siding locations;
- joint venture mineral development;
- alternate water treatment methods; and
- socioeconomic alternatives.

ALTERNATIVES DISCUSSED IN THE EIS

Alternative I is the no-action alternative; ASARCO would not develop the Rock Creek Project.

Table S-2 provides a side-by-side comparison of the components of three action alternatives. The proposed Rock Creek Project (Alternative II) comprises a 2,422-acre mine permit area with an associated

TABLE S-2.
ASARCO Rock Creek Project Alternative Comparison

Project Facility or Feature	Alternative II ASARCO Proposal	Alternative III Proposed Project w/Mitigations	Alternative IV Modified Project w/Mitigations
Mill Site	Upper end West Fork Rock Creek	Same as Alternative II	Confluence of East and West forks Rock Creek
Tailings Impoundment	Rock Creek site 325 feet high, 324 acres, upstream construction	Same as Alternative II except modified centerline design w/technical review panel	Same as Alternative III
Adit Waste Rock Dump	Southeast of adit 600,000 tons	Above mill site 600,000 tons, some used to create millsite	No waste rock dump. 1,000,000 tons, most of which used to create mill site, remainder used for starter dam
Mine Adit, Length & Grade (to underground crusher)	Up Chicago Peak Rd (FDR No. 2741) 9,000' @+12.7%	Same as Alternative II	At confluence mill site 15,530' @+12%
Mine Adit Access	New 8,800' road @+6.5%, 20' wide with 50' ROW, graveled	FDR No. 150 reconst 1,100' to 24' wide, FDR No. 2741 & unnamed spur, reconst 7,900' to 24' wide, graveled	All within mill site boundary except for short spur off of FDR No. 150 for large equipment
Exploration Adit Length & Grade	Up FDR No. 2741 6,592' @-10%	Same as Alternative II	Same as Alternative II
Exploration Adit Waste Rock	178,000 tons, Placed downhill of adit entrance	Same as Alternative II	Same as Alternative II
Exploration Adit Road, Length & Grade	Upgrade FDR No. 2741 for 4.6 mi. & reconst 1,200' spur to 20' wide	Same as Alternative II	Same as Alternative II plus improve 2.8 miles of FDR No. 150 above confluence mill site
Exploration Adit Water Discharge Line	6" polyethylene line approx 8.5 mi. both X-C & along Rd 150, laid on surface for 3 yrs	Same as Alternative II	Same as Alternative II
New Road Construction	(1) 1.3 mi. new const beginning of FDR No. 150, 24' paved	(1) 2.3 mi. new const beginning of FDR No. 150, 24' paved (different location than Alternative II)	(1) Same as Alternative III
	(2) Const 1.1 mi. of 16' graveled road around mill	(2) Same as Alternative II except 24'	(2) N/A
	(3) N/A	(3) Const 1,200' to connect FDR No. 150 to FDR No. 1022, gravel, 14' wide	(3) Same as Alternative III
	(4) Const 2.3 mi. of 20' graveled road from Sec. 15 to impoundment and const 5,500' of 20' graveled road in Sec. 3 & 10, both along slurry/reclaim lines	(4) Const 3,200' of 14' gravel road along slurry line, Sec 3 & 10	(4) N/A
	(5) N/A	(5) 400' of 10' road for slurry/reclaim line (Rd150-B to water reclaim pump)	(5) Same as Alternative III
	(6) Const 1.6 mi. of 14' road around S & W of tailings imp for access to dam base.	(6) Const 1.6 mi. of 14' road around S end of tailings imp for access to dam base & rail load-out (paved w/turnouts)	(6) Same as Alternative III
	(7) N/A	(7) Const 1,200' of 14' road to access rail load-out (paved)	(7) Same as Alternative III
	(8) N/A	(8) Const 3,000' of 10' road - gravel for seepage collection line	(8) Same as Alternative III
	(9) See Mine Adit Access (above) for additional road work	(9) N/A	(9) N/A
	TOTALS: 1.3 mi. new paved and 6.0 mi. new gravel roads	**TOTALS:** 4.2 mi. new paved and 2.6 mi. new gravel roads	**TOTALS: 4.2 mi. new paved and 0.8 mi. new gravel roads**

TABLE S-2.
ASARCO Rock Creek Project Alternative Comparison (Cont'd)

Project Facility or Feature	Alternative II ASARCO Proposal	Alternative III Proposed Project w/Mitigations	Alternative IV Modified Project w/Mitigations
Road Reconstruction	(1) FDR No. 150 to mill, widened to 24' & paved for 5.1 mi.	(1) Same as Alternative II, but 4.4 mi.	(1) Same as Alternative II except only to confluence mill site, 2.9 mi.
	(2) FDR No. 150B from FDR No. 150 to seepage collection system 3,600' of 14' (gravel)	(2) Improve FDR No. 150-B for 1.9 mi. from Rock Creek crossing to tailings impoundment, widen to 20' slurry line on inside edge of road (paved w/turnouts)	(2) Same as Alternative II
	(3) N/A	(3) Government Mtn Road, 2,600' 14' wide (paved) to rail load-out	(3) Same as Alternative II
	(4) Discharge line road to river 4,800 - 14' wide (dirt)	(4) Discharge line road to river - 6,200' by 10' wide (gravel)	(4) Same as Alternative II
	(5) N/A	(5) See Mine Adit Access (above) for additional road work	(5) N/A
	(6) See exploration adit road for additional work	(6) Same as Alternative II	(6) Same as Alternative II
	TOTALS: 6.7 mi.	**TOTALS: 8.0 mi.**	**TOTALS: 6.5 mi.**
Slurry and Reclaim Lines	From mill along FDR No. 150 to approx. center Sec. 3, then X-C to impoundment 5.1 mi. (two 10" high pressure urethane-lined steel slurry lines on piers, 1 buried 12' steel reclaim line) 3.4 mi. would be X-C, 9,100' along FDR No. 150	Same as Alternative II to SE of Sec. 15 then continues on FDR No. 150 to SE of Sec. 22 where it follows FDR No. 150-B to impoundment 3,200 X-C in Sec. 10 & 5.0 mi. parallels FDR No. 150	From mill along FDR No. 150 to intersection of old and new FDR No. 150, parallels FDR No.150B to tailings impoundment 4.1 mi. two 12" low pressure polyethylene, (buried) 400' X-C line from FDR No. 150B to top of impoundment (two 10" high pressure steel)
Excess Mine Adit Water Handling	(1) 12" polyethylene line buried adjacent to road from adit to mill, 6,700'	(1) Buried from adit down ridge 3,000' to mill	(1) N/A
	(2) From mill 12" buried line parallels slurry line to Sec. 15, then parallel's FDR No. 150 to MT Hwy 200, then would parallel hwy for 500', would cross and parallel road to Clark Fork for 6.9 mi.	(2) 12" steel excess water line parallels slurry line to intersection of new FDR No. 150, then parallels FDR No. 150 to south section line of Sec. 28, remainder same as Alternative II, 6.9 mi.	(2) Follows same route as Alternative III except starts at confluence mill site, 6.1 mi.
Transmission Line 230 kV Pole Line	Parallels existing 230 kV line from switchyard. Would cross hwy, then parallel newly constructed & reconstructed FDR No. 150 to mill, 6.9 mi.	Starts as in Alternative II, then parallels proposed FDR No. 150 & reconstructed FDR No. 150 to mill **6.85 mi. total length**	Same as Alternative III except only goes to confluence mill site 5.5 mi.
Conveyor Line	From adit to mill 2,500' by 42" wide	Same as Alternative II	All within mill site
Wilderness Ventilation Adit	On approx 57% slope, 1,600' NE of ridge @ elev of 5,760'	In the cliffs on approx. 150% slope, 400' NE of ridge @ elev of 6,700'	Same as Alternative III
Rail Load-out Location	At Herford siding	Miller Gulch	Same as Alternative III
Tailings Impoundment Starter Dam Borrow	735,000 cu. yards of borrow from within impoundment & 2 borrow sites (27.2 acres)	Same as Alternative II	735,000 cu. yards of borrow from within impoundment, waste rock from adit construction and borrow site 3 (27.2 acres)

TABLE S-2.
ASARCO Rock Creek Project Alternative Comparison (Cont'd)

Project Facility or Feature	Alternative II ASARCO Proposal	Alternative III Proposed Project w/Mitigations	Alternative IV Modified Project w/Mitigations
Soil Storage			
(1) Exploration Adit	(1) North end; 1.2 ac; 8,757 cy	(1) Same as Alternative II	(1) Same as Alternative II
(2) Support Facilities	(2) Adjacent storage; 1.3 ac; 4,193 cy	(2) Same as Alternative II	(2) Same as Alternative II
(3) Tailings Impoundment and associated components	(3) Impoundment, borrow areas, pump station S-1 parallel to powerline; 11.3 ac; 248,086 cy S-2 northeast corner near borrow site B-2; 8.3 ac; 179,649 cy Roads (access, haul); adjacent storage; 5.4 ac; 9,290 cy Water control structures; adjacent storage; 9.2 ac; 17,141 cy	(3) Similar to Alternative II but stockpiles S-1 and S-2 expanded to handle additional volume: S-1 increases to 18.1 ac; 563,227 cy S-2 increases to 16.4 ac; 549,598 cy	(3) Same as Alternative II
(4) Transportation Corridor	(4) Stored adjacent to each component; total 29.3 ac; 56,371 cy	(4) Soil stored adjacent to each component only when salvage showed clear benefit to revegetation and would not result in excessive disturbance	(4) Same as Alternative III
(5) Water Treatment Facility	(5) Adjacent storage; 10.0 ac; 32,269 cy	(5) Same as Alternative II	(5) Same as Alternative II
(6) Mill Facilities	(6) S-3 south end; 2.5 ac; 42,271 cy S-4 north end; 3.4 ac; 56,910 cy	(6) Similar to Alternative II but stockpiles S-1 and S-2 expanded to handle additional volume: S-3 increases to 78,921 cy S-4 increases to 93,560 cy	(6) New location at confluences mill site: north-center; 4.1 ac; 151,665 cy
(7) Mine	(7) N/A	(7) Similar to Alternative II but new waste rock dump location has salvageable soil; stored along toe/sides of 2 small waste rock dumps; 9,681 cy	(7) Included in mill facilities (6) above
	Total cubic yards: 655,949	**Total cubic yards: 1,367,649**	**Total cubic yards: 1,313,554**
Mine Adit Water Treatment	Treatment setting and flocculation with a passive biotreatment and ion exchange system	Same as Alternative II	Same as Alternative II
Exploration Adit Water Treatment	Pressure filtration, oil skimmer, and a passive biotreatment and ion exchange system	Same as Alternative II	Same as Alternative II

Notes: X-C means cross country; N/A means not applicable; ROW means right-of-way; cy means cubic yards.

surface disturbance of 584 acres. Development of the proposed project would consist of mill facilities, underground mine workings, four adits (one exploration, one wilderness ventilation, and two mine adits), utility and transportation corridors, a tailings impoundment, water treatment facilities, and a rail load-out (see **Figure S-2**). The primary facilities would be located within the Rock Creek drainage, from the tailings impoundment and water treatment facilities near Montana Highway 200 to the mill facilities in the upper West Fork of Rock Creek. The exploration adit would be located off Chicago Peak Road (FDR No. 2741) about 0.5 miles from the CMW boundary. The ventilation adit would be located about 0.75 miles north of Saint Paul Peak within the CMW. The rail load-out would be located on Montana Highway 200 about 6 miles northwest of the junction of Forest Development Road (FDR) No. 150 and the highway.

Construction of the exploration adit would last about 1 year and would have a peak employment of 55 workers. The mine would be developed over a 3-year period with a peak construction work force of 433. Full production would last for about 30 years with an operation work force of 355. Postmining reclamation is estimated to last 2 years and would involve about 35 workers.

Alternative III incorporates modifications to some facility locations and impoundment construction as well as mitigations proposed by the lead agencies to reduce or eliminate undesirable environmental impacts and increases the surface disturbance to 609 acres (see **Figure S-3**). These mitigations are in addition to or instead of mitigations proposed by ASARCO. Operational and postoperational monitoring would be increased. This alternative reduces or eliminates adverse impacts associated with all of the identified significant issues except socioeconomics.

Alternative IV includes the modifications and mitigations proposed for Alternative III as well as an alternate mill/mine adit site. The relocation of the mill/mine adit site reduces the surface disturbance to 542 acres (see **Figure S-4**). The construction and mine development period would be increased to 3.25 years. This alternative further reduces or eliminates adverse impacts associated with all eight significant issues.

THE AFFECTED ENVIRONMENT

The project area is situated in the Kaniksu National Forest (in Montana, administered by the Kootenai Nation Forest (KNF)), 13 miles northeast of Noxon in northwestern Montana, at the base of the Cabinet Mountains and adjacent to the CMW. Most of the area is forested. Annual precipitation varies over the area, and is largely influenced by elevation and topography. Rock Creek and its east and west forks, and the Clark Fork River provide surface water drainage.

Public lands are managed by KNF under the multiple use policies of the KNF Forest Plan. Small areas of private land occur in the project area. Timber harvesting, recreation, and wildlife habitat are the predominant land uses. The affected environment is described in detail in the draft EIS.

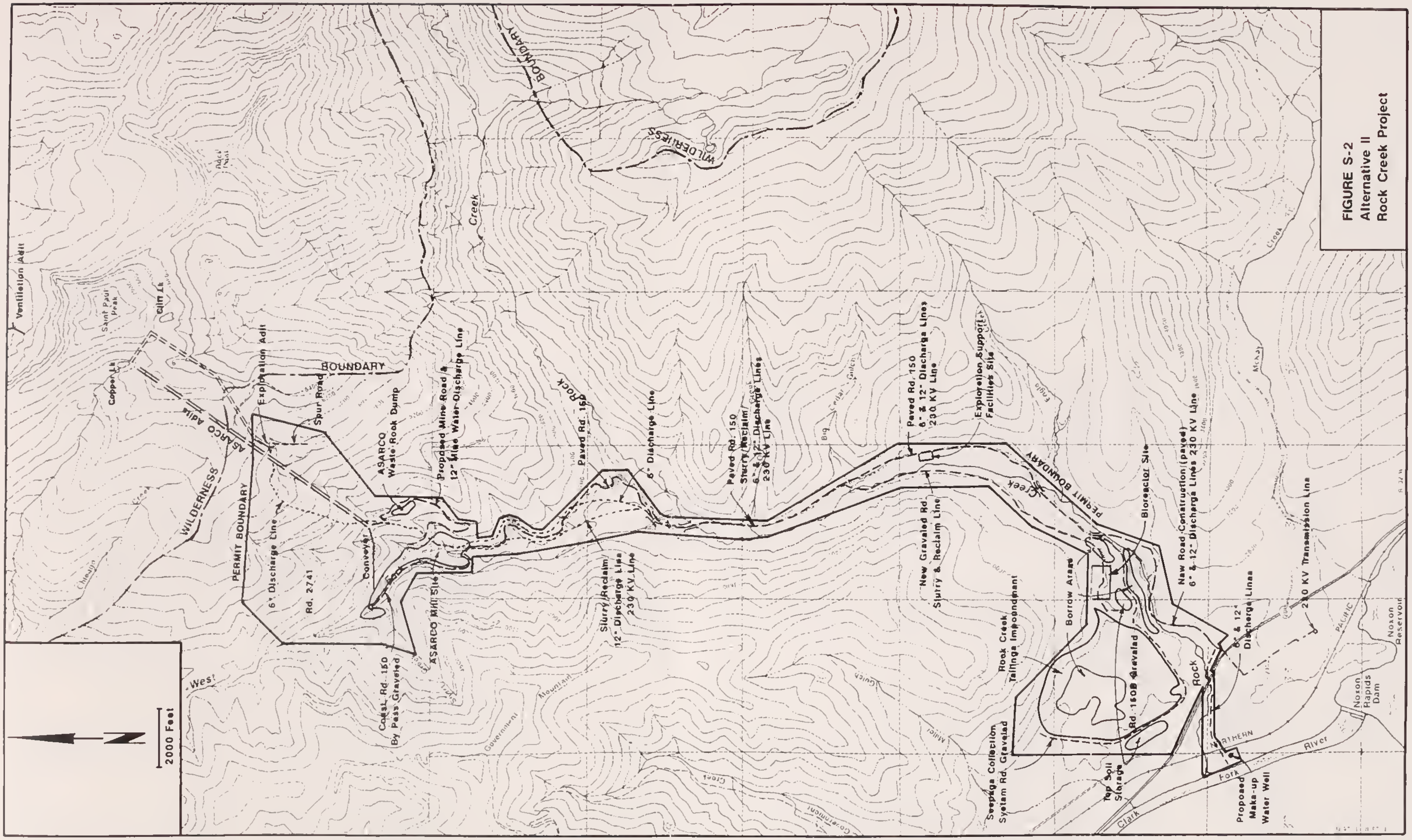

FIGURE S-2
Alternative II
Rock Creek Project

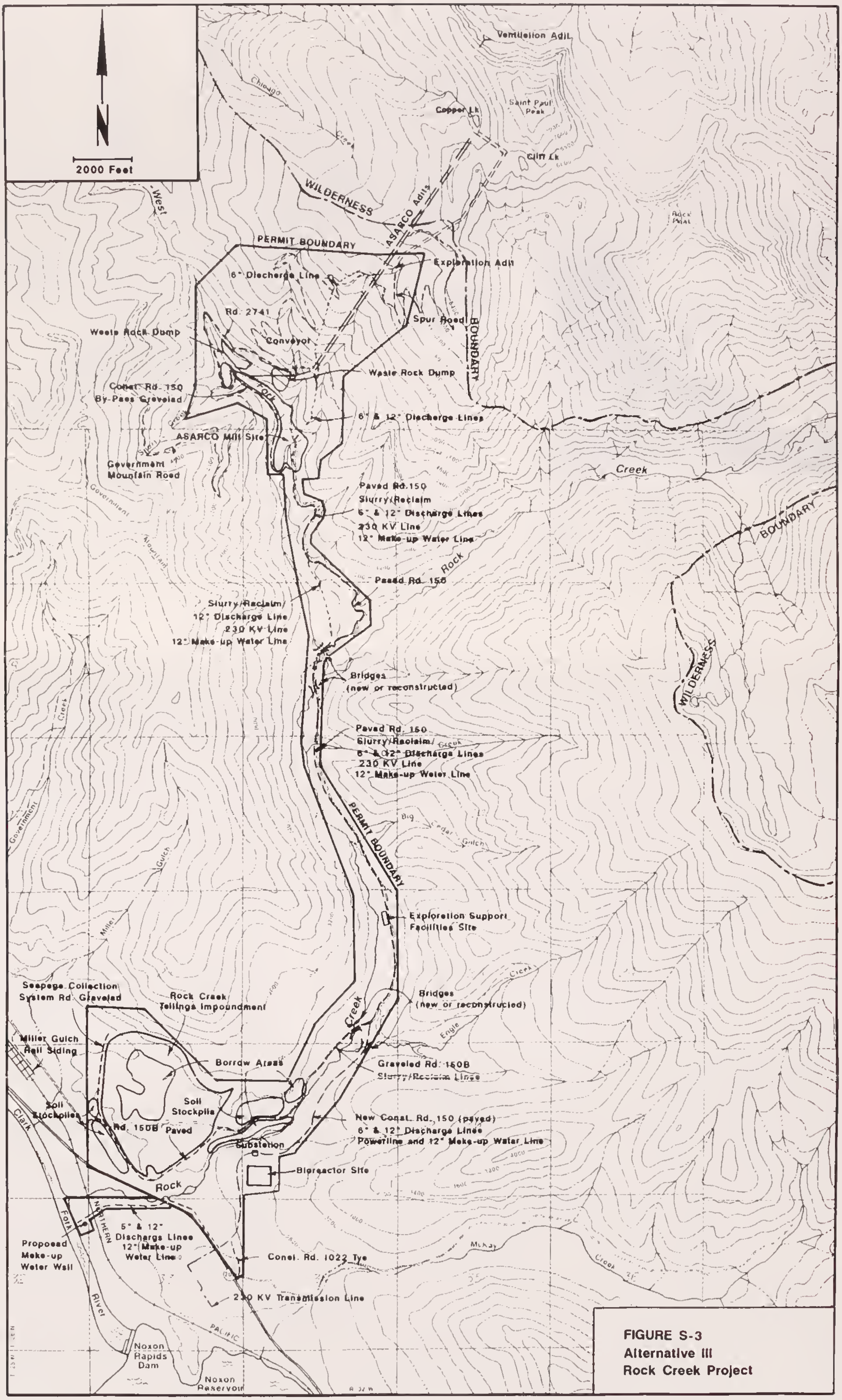

FIGURE S-3
Alternative III
Rock Creek Project

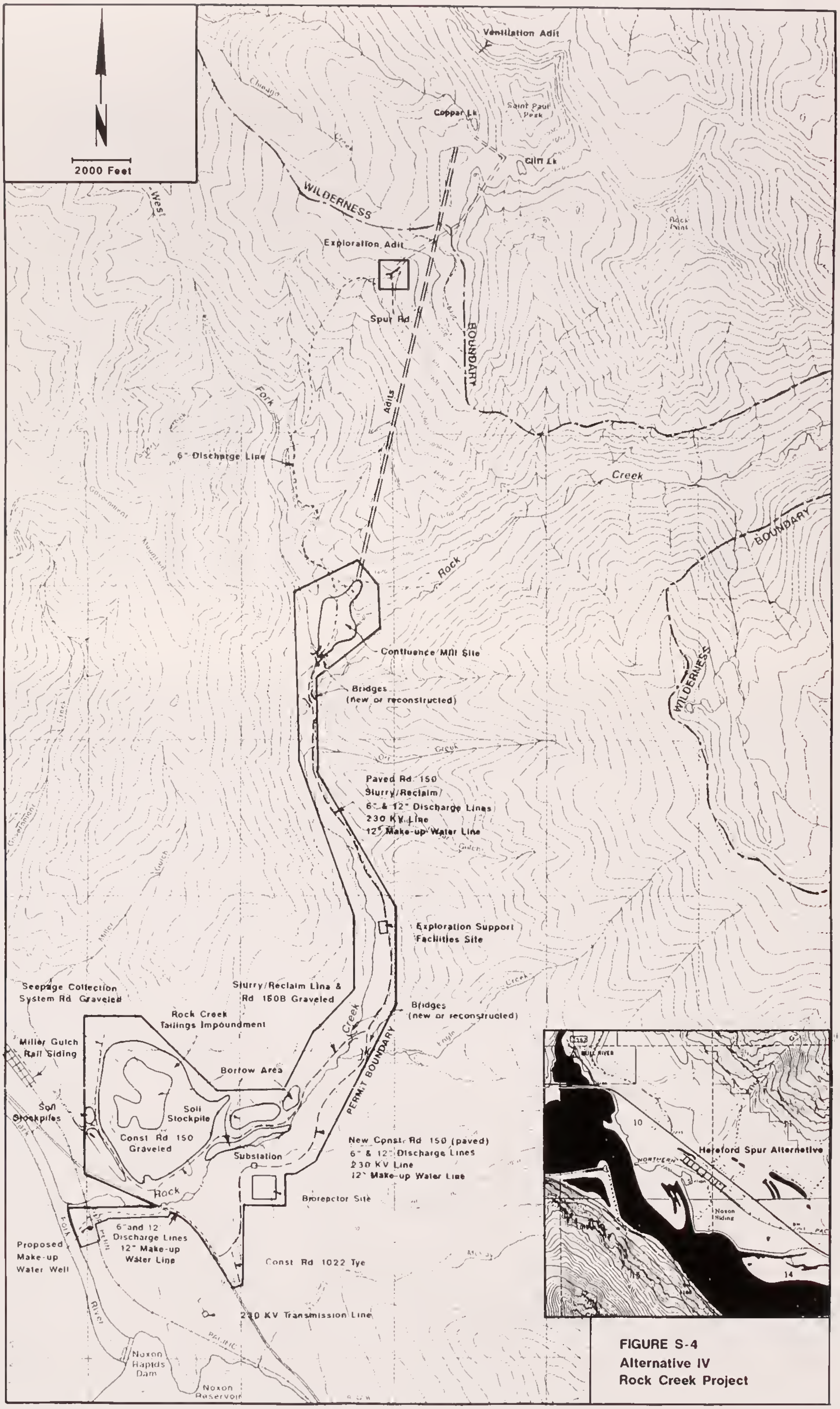

FIGURE S-4
Alternative IV
Rock Creek Project

CONSEQUENCES OF THE PROPOSED PROJECT AND ALTERNATIVES

All alternatives would result in impacts of varying magnitude, duration, and importance to resources with regards to the eight issues disscussed under Identification of Issues. Howver, as proposed, all action alternatives for the Rock Creek Project would result in potentially significant or significant impacts to environmental resources specified in in six of the issues. They are briefly summarized below:

Issue 1: Effects on quantity and quality of Montana and Idaho surface and ground water resources.

Effects are predicted to impact

- aquatic invertebrates from sediment and nutrient loads (alternative II and III);
- surface water quality from spills and pipeline ruptures (all action alternatives); and
- wilderness lake water levels and aquatic life from remote possibility of subsidence (all action alternatives).

Issue 2: Effects on fish and wildlife habitat and current and proposed threatened and endangered species.

Effects are predicted to impact

- grizzly bear habitat due to lost and reduced effective habitat (all action alternatives);
- neotropical migrant birds due to direct and indirect loss of old growth habitat (all action alternatives);
- sensitive animal species (harlequin duck, lynx, fisher and wolverine) due to loss, degradation and fragmentation of habitat (all action alternatives);
- sensitive aquatic species (bull and westslope cutthroat trout) due to increased sediment and increased winter breeding with non-native species (alternatives II and III); and
- pileated woodpecker due to loss of up to 21 percent of old-growth habitat (all action alternatives).

Issue 3: Stability of the tailings impoundment.

Effects from impoundment failure are predicted to impact

- surface water quality and aquatic life in lower Rock Creek and Clark Fork River if failure occurred (all action alternatives).

Issue 5: Effects on old growth ecosystems.

Effects are predicted to

- destroy 91 to 208 (depending on the alternative) acres of old growth and reduce habitat quality and effectiveness as well as biological diversity (all action alternatives).

Issue 6: Effects on Waters of the U.S. and wetlands.

Effects are predicted to impact

- Up to 9.6 acres of Waters of the U.S. and wetlands and decrease functions and values of mitigation sites, up to 13.8 acres (depending on the alternative), were established (all action alternatives).

Issue 8: Effects on aesthetic quality, including noise, visual, and wilderness experiences.

Effects are predicted to impact

- mountain goats and travelers on FDR No. 150 and residents at Herford (Alternative II only) due to increases in sound levels from mine activities and traffic respectively (all action alternatives);
- visual quality of Rock Creek and Clark Fork Valley and ability to comply with Forest Service standards due to size, shape, color, texture and contrast of mine facilities with surrounding landscapes and the amount of time needed for reclamation/revegetation to mitigate impacts (all action alternatives); and
- solitude of wilderness users near the ventilation adit due to high visibility and elevated noise levels (alternative II).

Table S-3 provides a summary comparison of the potentially significant or significant effects of all alternatives. (This table is presented at the back of this summary.)

Changes in Water Resources

Surface and Ground Water Quality. Construction of the mill pad, roads, and waste rock dumps would temporarily increase the concentrations of sediment and nitrogen loads of Rock Creek for alternatives II and III, in turn, impacting macroinvertebrate populations. The concentration of total suspended solids in Rock Creek probably would remain below 20 mg/L (see Chapter 4, Hydrology). The concentration of nitrogen cannot be estimated with certainty and would depend upon the amount of nitrogen contamination of the waste rock, climate, infiltration beneath the mill pad, starter dams, and waste rock piles, and amount of surface runoff circumventing containment barriers and diversion structures. Aquatic invertebrates could be significantly impacted from increased nitrates in the short term. Impacts to aquatic plant communities or algae would be potentially significant in the short term from increases in nitrogen. Alternative III mitigations would reduce sediment loads in Rock Creek, lessening the impacts to aquatic life. For Alternative IV, suspended sediment produced from construction of the mill facility, and residual nitrogen from blasting would not effect the West Fork of Rock Creek because the mill would be located farther downstream, there would be less road construction/reconstruction, and there would be no waste rock dump. The 300-foot stream buffer around the confluence mill site would further reduce sediment impacts to lower reaches of Rock Creek.

Impacts to aquatics and fisheries from spills and/or pipeline ruptures would be potentially significant for all action alternatives. The potential for spills to reach surface waters would be somewhat reduced due to consolidation of utility and road corridors and the relocation of the lower portion of FDR No. 150 away from Rock Creek. Relocating the mill to the confluence of the East and West forks of Rock Creek would eliminate the potential for materials from spills and pipeline ruptures to reach the West Fork of Rock Creek.

Wilderness Lakes. ASARCO would leave a minimum of 100 feet of overburden between mine workings and the ground surface. In the vicinity of Copper and Cliff lakes, in excess of 800 feet of overburden exists. Given this thickness of overburden and the inherent strength of the rock, the potential for fracturing and subsidence are extremely remote. Regardless, rock mechanics data from the exploration adit and mined areas would be required for alternatives III and IV. These data would be used for the agencies' evaluation and approval of updated mine plans prior to mining near the lakes. Impacts to wilderness lakes, wetlands, and aquatic life from subsidence would be potentially significant for all action alternatives although the potential for subsidence would be extremely remote.

A contingency plan would be developed to mitigate impacts to the lakes and any associated wetlands to comply with the 404(b)(1) permitting process.

Changes in Wildlife Habitat/Threatened and Endangered Species

Grizzly Bears. The proposed project would physically alter habitat due to the construction of mine facilities (584 acres under Alternative II, 609 under Alternative III, and 542 under Alternative IV). Additional habitat effectiveness would be significantly reduced due to increased human activity. The reduced habitat effectiveness would be greatest during the construction phase. Alternative III impacts the greatest area (3,695 acres) and Alternative IV impacts the least area (2,390 acres).

Some road closures already have been implemented by KNF for bear management purposes (a total of 6.9 miles). An additional 4.4 miles would need to be closed for Alternative II and 4.5 miles for alternatives III and IV to meet the open road density standard of 0.75 miles of open road per acre within each bear analysis area (BAA). These additional closures would reduce impacts to grizzly bears, but would not eliminate nor reduce the significance of the impacts. The existing Forest Plan standards for grizzly bear management on the KNF have been designed to provide the necessary components for a recovered grizzly bear population across the Cabinet-Yaak ecosystem (a minimum mortality risk, adequate food supply, spatial distribution of habitat and grizzly bears). The existing bear management standards are not being met in Rock Creek and the adjacent area, and thus, the area is not meeting the requirements for recovery of grizzly bear. The proposed project would result in a further decrease in the grizzly bear standards for Rock Creek and the surrounding area.

Other Threatened and Endangered Species. The increased risk of road-killed deer would increase the potential for vehicle collisions with feeding bald eagles along Montana Highway 200 and the railroad. Destruction of one of the nesting pairs using the lower Clark Fork Valley would significantly affect recovery of the species in this area. Mitigations for alternatives III and IV include removal of road-killed deer from road rights-of-way. This, in conjunction with the use of FDR No. 150B to access the Miller Gulch rail load-out, would reduce potential impacts to bald eagles.

Neotropical Migrant Birds. The loss of old growth habitat could significantly affect those neotropical migrant birds (birds that seasonally migrate from tropical areas such as Mexico to North America) that are associated with old growth ecosystems.

Sensitive Animal Species. All action alternatives could have significant effects on some sensitive species in the short and long terms. The harlequin duck, fisher, lynx, and wolverine would suffer habitat loss and degradation and increased mortality risks that could result in declines in local population numbers and/or occurrence. These could be significant and long term effects.

The proposed project and alternatives would create high levels of disturbance (noise, human presence, and some physical land alternation) along Rock Creek that would cause it to become unsuitable habitat for nesting harlequin ducks. As a result, harlequin ducks probably would not successfully breed and/or occur in or near Rock Creek during mine life. Additionally, harlequins potentially may not return to Rock Creek to nest after 35 years (estimated mine life) because the knowledge of Rock Creek as a nesting area could not be passed on to future generations of harlequins. Loss of one of the four breeding areas in the lower Clark Fork drainage and the associated decline in recruitment of the harlequin duck would be significant to the lower Clark Fork subpopulation. Should loss of this lower Clark Fork subpopulation occur, stability of the Montana harlequin duck population could decline.

The proposed project under all action alternatives would alter or make less effective key fisher habitat (old growth, riparian, and travel corridors). While less old growth habitat would be lost under alternatives III and IV, the loss of habitat would be substantial and would result in same effects as Alternative II. Additionally, an increase in mortality risk due to inadvertent trapping, poaching, and vehicle-animal collisions would occur. The proposed project would add to the cumulative habitat degradation, ecosystem fragmentation, and mortality risks that threaten the security and recovery of the fisher in the Cabinet Mountain area.

The proposed project under all action alternatives would have similar, potentially significant effects on the lynx and wolverine as on the fisher. Increased mortality risks from trapping, hunting, poaching, and vehicle-animal collisions would occur. While resulting deaths probably would not be frequent, loss of individuals in these rare species, especially the lynx, could be significant. The proposed project under all alternatives would degrade wolverine and lynx habitat by altering land (such as mill site and road building), creating disturbances (such as mining noise and traffic), decreasing security of the area, and further fragmenting the narrow Cabinet Mountain ecosystem. Essentially, portions of Rock Creek drainage could become an unsuitable area for lynx and wolverines in the short term. The proposed project would add to the cumulative habitat degradation, ecosystem fragmentation, and mortality risks that threaten the security of the lynx and wolverine in the Cabinet Mountain area.

Sensitive Aquatic Species. All action alternatives would impact resident populations of bull trout and westslope cutthroat trout in Rock Creek. These impacts are the result of increased sediment loads from road construction and runoff. Rock Creek already has a high level of fine sediment, close to critical levels, in available spawning gravel. Increased sedimentation would significantly reduce fry emergence and potentially would lead to elimination of these fish populations due to spawning failure. Since Rock Creek and Bull River are the two major spawning areas for the Cabinet Gorge bull trout populations, degradation of the Rock Creek bull trout spawning habitat would significantly impact those populations.

Alternatives II and III would impact spawning habitat and resident fish populations the entire length of Rock Creek from the upper mill site to the Clark Fork River. These two action alternatives could have the greatest potential impact to the Cabinet Gorge bull trout populations. However, under alternatives III and IV, the identification and reduction of existing sediment sources in the Rock Creek and Bull River drainages by ASARCO prior to mine construction would help offset short-term increases in sediment due to facility construction. The possible reduction of sediment sources in spawning streams in the Bull River drainage could improve bull trout populations and viability in those streams. These mitigations could reduce project-related impacts to the Cabinet Gorge Reservoir bull trout population. Other mitigations, such as construction-best management practices (BMP) monitoring also would help reduce sediment impacts to sensitive aquatic species under alternatives III and IV.

Moving the mill site to the Rock Creek confluence (Alternative IV) eliminates project-related impacts to the populations of bull and westslope cutthroat trout in the West Fork of Rock Creek as well as reducing sediment impacts to spawning habitat and fish populations in Rock Creek below the confluence with its East Fork. Impacts to the Cabinet Gorge bull trout populations would be further reduced.

Pileated woodpecker. All action alternatives would have a potentially significant effect on local populations of the pileated woodpecker. This impact would be caused by eliminating or degrading key habitat (primarily old growth) ranging from 21 to 9.3 percent loss (alternatives II to IV, respectively). The anticipated small stand size, lower habitat quality, and limited quantity of habitat would affect sustainability of local populations .

Impoundment Stability

Failure of the impoundment, while a remote possibility, would have a major and significant impact to surface waters and aquatics/fisheries.

Changes in Old Growth Timber

Old Growth Habitat. All action alternatives would physically destroy and/or disturb old growth, rendering it biologically less effective or ineffective. Alternative II would affect a total of 208 acres; Alternative III, 154 acres; and Alternative IV, 91 acres. Mining-related disturbances would fragment stands below the KNF Forest Plan's 50-acre limit and create more edge affect in larger stands. The percent of biologically effective habitat would be below the 8 to 10 percent needed to support old-growth-dependent species for all action alternatives (a range of 5.5 for Alternative II to 6.4 percent for Alternative IV). Pileated woodpeckers, goshawks, and fishers are among old-growth-dependent species that would be affected by this loss. In turn, there could be a potentially significant decline in species diversity under all action alternatives.

Changes in Wetlands and Waters of the U.S.

All three action alternatives would fill Waters of the U.S. and wetlands (see **Table 2-4**). The tailings impoundment would directly and indirectly impact the same 5.4 acres of wetlands for all action alternatives. The location of the mill site and waste rock dump and the alignment of FDR No. 150 determines the total amount of wetlands and Waters of the U.S. impacted by each alternative. Alternative II would impact a total of 8.1 acres of wetlands and 1.5 acres of Waters of the U.S. Alternative III would impact a total of 6.2 acres of wetland and 1.5 acres of Waters of the U.S.; and Alternative IV would impact a total of 6.0 acres of wetland and 0.4 acres of Waters of the U.S. These would be significant impacts.

Temporary indirect impacts to Waters of the U.S. and wetlands would occur during construction of roads and the mill pad due to increased sediment contributions. Proposed BMPs would reduce sediment contributions. Alternatives II and III would have temporary impacts along the entire length of Rock Creek and both forks. Alternative IV primarily would have indirect impacts below the confluence of the East Fork of Rock Creek. Very few indirect impacts would be associated with the exploration adit other than the reconstruction of FDR No. 2741.

ASARCO has identified 12.3 acres of wetland mitigation sites and 1.5 acres of Waters of the U.S. mitigation sites for Alternative II (see **Table 2-5**). Only 10.5 acres of the wetland mitigation sites would be available for alternatives III and IV due to the realignment of a segment of FDR No. 150. There are, however, potential sites within the riparian zone (a composite of wetland and upland vegetation sites) along Rock Creek that could be identified and used for mitigation should the COE require additional mitigation areas. The mitigation sites would be developed as replacement wetlands prior to disturbance of the existing wetlands. The 1.1 acres of Waters of the U.S. at the upper mill site (alternatives II and III) would not be reconstructed until the mill site was reclaimed. The 0.4 acres of Waters of the U.S. along the FDR No. 150 and the utility corridor under all action alternatives would be temporarily impacted during construction. The primary functions and values of the created wetlands would be to re-establish diversity and abundance of habitat for aquatic and terrestrial species, reduce sediment transport to Rock Creek, and attenuate peak flows. A temporary but potentially significant decrease in some of the wetland functions and values could occur until the created wetlands were revegetated and fully established.

Changes in Aesthetic Quality

Noise. All action alternatives could create significant long-term noise-related impacts to mountain goats and their critical summer habitat (see above). These impacts would be associated predominantly with the exploration adit and the wilderness ventilation adit. Sound mitigations at the ventilation adit would minimally reduce the impacts. Alternative IV may also affect critical winter range at Rock Creek Meadows should loud noises, such as blasting, reach the winter range.

Blasting during adit construction would generate noise up to 80 dBA in the CMW and the Clark Fork Valley. While general mine operations would not be audible in the Clark Fork Valley, the operation of heavy equipment at the impoundment site would be audible in adjacent areas. Activities at the Hereford rail load-out (Alternative II) would significantly increase noise levels to residences in the area. Relocation of the load-out to Miller Gulch would eliminate that impact and place the noise in a less populated area.

Recreationists using the Rock Creek drainage and FDR nos. 150 and 2741 would be able to hear mine and mill operations when within a mile of the facilities. Traffic related noise on FDR No. 150 would be increased significantly from 30 to 70 dBA. The level of the noise would be somewhat reduced in alternatives III and IV with the implementation of several noise mitigations.

Noise impacts to recreationists within the CMW would be associated primarily with the exploration and wilderness ventilation adits and blasting and construction equipment noises (up to 80 dBA). Impacts from exploration activities would be greatest during the first couple of years of mine activities; after that, noise would only be generated by ventilation exhaust fans. Sound from all adits would be audible (at 45 dBA) for approximately 1 mile away from the sites. The wilderness ventilation adit would only be in place and used during the last 15 to 20 years of mining. These sounds would negatively impact CMW visitors using nearby areas. Sound mitigations in alternatives III and IV would reduce the fan noise to background levels (30 dBA) within 100 feet.

Scenic Quality. Proposed timber sale activities will have an impact on the existing visual quality. All three action alternatives would result in significant visual impacts for the Rock Creek drainage and Clark Fork Valley. Impacts would be associated with all features of the proposed project: the exploration adit, the mill site, the mine portal and associated waste rock dumps, the ventilation adit (see wilderness below), the utility corridors and the impoundment.

The exploration adit portal would be most noticeable from Government Mountain, though the impacts would diminish with distance. Lights from night operations would be visible in portions of the Clark Fork Valley. These visual impacts would be reduced in alternatives III and IV. The waste rock dump would be revegetated to reduce contrast. Lights would be screened or baffled to reduce visibility across the valley.

The upper mill site in alternatives II and III would be highly visible to the public using FDR nos. 150 and 2741 but not visible from the Clark Fork Valley. The conveyor from the mine portal would create a strong linear feature that would contrast greatly with the natural landscape. The cut-and-fill slopes of the new mine access road for Alternative II would be visible for a long time. Under Alternative III, the new mine access road would not be built, reducing the amount of disturbance and visibility. The buildings would be painted or treated to reduce the amount of contrast.

The waste rock dump for Alternative II would be a prominent feature that would be difficult to revegetate and would remain highly visible for many years. The dump would be divided into two smaller dumps in Alternative III and graded closer to the natural slopes than was proposed in Alternative II. The dumps would be topsoiled and revegetated to facilitate reduction of visual impacts.

Alternative IV would move the mill site to the confluence with the East Fork of Rock Creek. A minimum 100-foot visual buffer would be left on either side of FDR No. 150 to provide screening. There would be no waste rock dump for this alternative as the rock would be used to build the mill pad and the impoundment starter dams. The face of the mill pad would be reclaimed immediately after construction. Visual impacts from the confluence mill site would be potentially significant.

Either design of the impoundment would result in a large artificial form visible from several areas in the Clark Fork Valley. The size, form, color and texture of the impoundment would contrast dramatically with the surrounding landscape. The long-lasting effects would gradually be reduced as trees and shrubs were established. Reclamation of the impoundment face would be done concurrently throughout mine life for Alternative II. Trees and shrubs, however, would be planted after the face of the impoundment was completely reclaimed for Alternative II. Alternatives III and IV would require additional detailed regrading and revegetation plans to facilitate the mitigation of visual impacts. Reclamation, including the planting of trees and shrubs for alternatives III and IV, would begin after year 7 and would be concurrent until operations ceased. Trees would also be planted along Montana Highway 200 for screening as soon as Agency permits were approved.

The proposed Visual Management System (VMS) Visual Quality Objectives (VQO) would not achieved during mine life for all action alternatives. The impoundment surface potentially could never meet Retention VQO standards under Alternative II, but additional reclamation requirements under alternatives III and IV would increase the likelihood that the standard could be achieved within several decades after final reclamation. Under Alternative IV the elimination of the waste rock dump, immediate planting of the mill pad face, and the visual buffer around the confluence mill site would further help this site meet VQO standards. Although the facility sites could eventually achieve prescribed VQOs several decades after mine closure and final reclamation, the additional reclamation requirements would shorten the amount of time required, but it would still take decades.

Wilderness. There would be two types of impacts to users of the CMW: noise-related and visual. The noise-related impacts would be greatest during the construction and operation of the exploration adit, construction of the mine adits and mine pad and the construction and operation of the wilderness ventilation adit (see Noise). Mitigations under alternatives III and IV would reduce these potentially significant impacts. Visual contrast of the impoundment surface would remain for all action alternatives due to its light color until completion of mine revegetation following mine closure. The area of disturbance for the ventilation adit would be reduced in alternatives III and IV by its relocation to a steeper site. Either location, however, is not in proximity to high use areas such as Rock, Saint Paul, and Moran lakes. Reclamation mitigations proposed under alternatives III and IV would restore a premining appearance to the ventilation adit.

THE AGENCIES' PREFERRED ALTERNATIVE

The Agencies' preferred alternative is Alternative IV, Modified Project with Mitigations. Alternative IV would result in construction of the exploration adit, mine, mill, tailings impoundment, rail load-out, passive biotreatment facility, and access roads. Some water would be stored in underground workings and/or the tailings impoundment, but excess water would be discharged to the Clark Fork River after treatment. Environmental requirements in addition to those proposed by ASARCO would be incorporated to minimize (to the extent possible) or eliminate environmental impacts. Additional monitoring would help detect trends as well as unacceptable impacts, should they occur. Measures would be developed to respond to and control these impacts.

TABLE S-3.
Summary Comparison of Potentially Significant and Significant Project Alternatives Impacts[1]

ENVIRONMENTAL ISSUE	PROJECT ALTERNATIVES			
	I (No Action)	II (ASARCO's Proposal)	III (Project With Mitigations)	IV (Modified Project With Mitigations)
Water Resources				
Surface water quality	Except for minor increases in sediment, existing surface water quality would be maintained.	Nitrogen loads would be temporarily increased in Rock Creek and the West Fork during mine construction and would impact aquatic invertebrates and algae in the short term.	Same as Alternative II	Similar to Alternative II but the aquatic life in West Fork of Rock Creek above the confluence mill site would not be affected by increased nitrogen from mine construction, or waste rock dumps. The 300' buffer zone around confluence mill site would reduce nitrogen loading to Rock Creek.
		Impacts from materials from spills and pipeline ruptures potentially could affect water quality in Rock Creek and the Clark Fork River.	Same as Alternative II except the potential for material from spills and pipeline ruptures to reach the main stem of Rock Creek is reduced.	Same as Alternative II except potential for spills and pipeline ruptures in West Fork of Rock Creek would be eliminated.
Wilderness lakes	Wilderness lakes would continue to experience natural and seasonal water level fluctuations.	The potential for subsidence is remote. Impacts would be potentially significant.	The potential for subsidence, although remote, would be reduced by additional rock mechanics studies and a subsidence control plan. Impacts would be potentially significant.	Same as Alternative III.
		Aquatic life and wetlands associated with Cliff and/or Copper lakes could be significantly impacted if subsidence occurred.	Potentially significant, short-term impacts to wetlands and aquatic life associated with Cliff and/or Copper lakes would be mitigated in accordance with a mitigation plan if subsidence occurred.	Same as Alternative III.
Wildlife Habitat and Threatened & Endangered (T&E) Species				
Grizzly bears	Continued availability of spring and fall grizzly bear habitat.	Direct physical loss of 584 acres of habitat. Habitat effectiveness would be reduced on an estimated 3,560 acres. This would have a potentially significant impact on grizzly bear habitat.	Direct physical loss of 609 acres of habitat. Habitat effectiveness would be reduced on an estimated 3,695 acres. This would have a potentially significant impact on grizzly bear habitat.	Direct physical loss of 542 acres of habitat. Habitat effectiveness would be reduced on an estimated 2,390 acres. This would have a potentially significant impact on grizzly bear habitat.
Other T&E species	Bald eagle use would continue to increase.	Increases in road-killed deer could slightly and indirectly increase mortality risk of bald eagles along MT Hwy. 200, FDR No. 150, and along the train tracks near the Hereford siding. Loss of one nesting pair of eagles could significantly affect recovery of the species in the area.	Increases in road-killed deer and associated bald eagle mortality risk along MT Hwy. 200 is less than Alternative II because of rerouting concentrate haulers to the Miller Gulch rail load-out along FDR No. 150B and daily removal of road-killed animals.	Same as Alternative III.

TABLE S-3.
Summary Comparison of Potentially Significant and Significant Project Alternatives Impacts (Cont'd)

ENVIRONMENTAL ISSUE	PROJECT ALTERNATIVES			
	I (No Action)	II (ASARCO's Proposal)	III (Project With Mitigations)	IV (Modified Project With Mitigations)
Neotropical migrant birds	Minor changes in forested habitat or activities of neotropical migrant birds.	Direct and indirect loss of old growth, riparian, and wetland habitats would affect songbirds in those areas. Potential loss of individual birds.	Same as Alternative II.	Same as Alternative II.
Sensitive animal species	Stability of harlequin duck population in lower Clark Fork would remain vulnerable.	Breeding harlequin ducks affected by and habitat degraded by increased noise level, human disturbance, and habitat alteration. This could result in loss of harlequin reproduction on Rock Creek. Loss of Rock Creek breeding area would be significant to security of the lower Clark Fork harlequin subpopulation.	Impacts to harlequin duck habitat lessened with relocation of FDR No. 150 out of the riparian area but remain potentially significant and similar to Alternative II.	Similar to Alternative III.
	Habitat for lynx, fishers, and wolverines would continue to degrade as fragmentation and habitat degradation continued.	Loss, degradation, and fragmentation of important fisher, lynx, and wolverine habitat, especially old growth, riparian areas and travel corridors could displace animals and/or increase stress and mortality risk.	Similar to Alternative II.	Similar to Alternative II.
		Loss of habitat and potential increases in hunting, trapping, poaching, and traffic collisions would add to the overall decline of fisher, lynx, and wolverine security and habitat in the Cabinet Mountains.	Similar to Alternative II.	Similar to Alternative II.
Sensitive aquatic species	Sediment impacts from private and KNF timber sales and other developments could have a significant impact on aquatic resources.	Increased sediment in West Fork and mainstem Rock Creek would significantly decrease emergence success of bull and cutthroat trout fry.	Modifications and mitigations would reduce the amount of sediment impacting Rock Creek spawning habitat and bull and cutthroat trout.	Sediment impacts to bull and westslope cutthroat trout would be minimized in the West Fork of Rock Creek. The 300 ft. buffer around the confluence mill site would reduce sedimentation impacts downstream.
	Natural changes in aquatic habitat are expected, marginal threat to long-term survival for Cabinet Gorge bull trout stock and long-term risk of loss of cutthroat population due to introgression.	Reduced bull trout habitat in Rock Creek could significantly impact Cabinet Gorge bull trout.	Reduction of existing sediment sources in Rock Creek and Bull River drainages would improve the status of bull trout and cutthroat populations in Rock Creek, and bull trout in Cabinet Gorge Reservoir.	Similar to Alternative III but 300-ft. buffer around the confluence mill site would further reduce sediment impacts to bull and cutthroat trout in mainstem Rock Creek and bull trout in Cabinet Gorge Reservoir.
		Potential increase in non-native fish species and interbreeding with native sensitive species (westslope cutthroat trout and bull trout).	Risk of interbreeding and non-native fish species increase would be reduced due to sediment mitigations.	Similar to Alternative II.

TABLE S-3.
Summary Comparison of Potentially Significant and Significant Project Alternatives Impacts (Cont'd)

ENVIRONMENTAL ISSUE	PROJECT ALTERNATIVES			
	I (No Action)	II (ASARCO's Proposal)	III (Project With Mitigations)	IV (Modified Project With Mitigations)
Pileated woodpecker	Habitat availability to sustain local populations of pileated woodpeckers would remain below recommended biologically sound levels.	Loss of 21% of effective old growth would potentially significantly affect sustainability of local pileated woodpecker populations.	Loss of 15% of effective old growth would potentially significantly affect sustainability of local pileated woodpecker populations.	Loss of 9.3% of effective old growth would potentially significantly affect sustainability of local pileated woodpecker populations.
Impoundment Stability	No tailings impoundment would be constructed, therefore no risk of failure.	Impacts from an impoundment failure to surface waters and aquatics would be potentially significant.	Same as Alternative II.	Same as Alternative II.
Old Growth Ecosystem				
(does not include replacement growth)	Approximately 7% of Compartment 711 would remain in old growth habitat. This percentage would change due to natural succession and/or natural occurrences, (e.g., fire).	About 208 acres of effective old growth habitat would be lost or degraded. Effective old growth habitat would decline to 5.5% of Compartment 711.	Similar to Alternative II but 154 acres of effective old growth habitat would be lost or degraded. Effective old growth habitat would decline to 5.9% of Compartment 711.	Similar to Alternative II but 91 acres of effective old growth habitat would be lost or degraded. Effective old growth habitat would decline to 6.4% of Compartment 711.
	Abundance of current old growth habitat would remain below the recommended levels to provide for long-term maintenance of viable old-growth-associated species in Compartment 711.	Biological diversity would be reduced and long-term occurrence and maintenance of old-growth-dependent species would be unlikely.	Similar to Alternative II.	Similar to Alternative II.
Waters of the U.S. & Wetlands				
Wetlands & riparian zones	Wetland and riparian zones could be disturbed by timber sale roads and development of private lands.	A total of 9.6 acres of Waters of the U.S. and wetlands would be disturbed by the project.	About 7.7 acres of Waters of the U.S. and wetlands would be affected.	Less than 6.4 acres of Waters of the U.S. and wetlands would be disturbed.
		Functions and values may decrease until the 13.8 acres of Waters of the U.S. and wetland mitigation sites were established.	Similar to Alternative II but only 10.5 acres of Waters of the U.S. and wetland mitigation sites have been identified.	Same as Alternative III.

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[1] For more detail, see Chapter 4.

TABLE S-3.
Summary Comparison of Potentially Significant and Significant Project Alternatives Impacts (Cont'd)

ENVIRONMENTAL ISSUE	PROJECT ALTERNATIVES			
	I (No Action)	II (ASARCO's Proposal)	III (Project With Mitigations)	IV (Modified Project With Mitigations)
Aesthetic Quality				
Noise	Existing noise levels in the Rock Creek drainage and Clark Fork Valley would be maintained except for changes associated with timber sales and private land development.	Traffic related noises would significantly increase on FDR No. 150 from 30 to 70 dBA.	Similar to Alternative II.	Similar to Alternative II.
		Activities at the Hereford rail load-out facility would generate noise up to 87 dBA daily between 8 a.m. and midnight. This would increase noise levels to residences in the area.	Noise-related impacts to Hereford residences would be avoided by moving the rail load-out to the Miller Gulch site. Sound levels at Miller Gulch would be similar to those at Hereford (Alternative II), but there are no nearby residences that would be impacted.	Same as Alternative II.
		Ventilation fans would operate continuously at about 123-96 dBA and would be heard at about 45 dBA up to a mile away (450 acres) for the last 15-20 years of mine operation. This would significantly affect the solitude expected by people visiting the area of the CMW near the adit.	Relocation of the ventilation adit and sound mitigations for the ventilation fans would reduce the noise level to 30 dBA within 100 feet of the adit. This reduces the impact to CMW visitors.	Same as Alternative III.
Scenic quality	Visual character of the Rock Creek drainage and the Clark Fork Valley would be retained.	Significant impacts to Rock Creek drainage and Clark Fork Valley from project features during construction and operation.	Significant impacts somewhat reduced by painting or staining mill facilities and immediate revegetation of cut slopes and waste rock dumps.	Similar to Alternative III except impacts at confluence mill site further reduced by visual buffer along FDR No. 150 and immediate revegetation of mill pad face following construction.
		Impoundment visibility would significantly impact travelers on MT Hwy. 200 due to lack of screening and postponement of planting trees until after mine closure and topographic changes.	Impoundment visibility along MT Hwy. 200 reduced by planting vegetative screen and concurrent planting of trees and shrubs after year 7 of impoundment construction.	Same as Alternative III.
		Impoundment surface highly visible in background for CMW users on high trails and peaks.	Similar to Alternative II, but long-term visibility reduced due to changes in revegetation plan.	Same as Alternative III.
		Utility corridor visible to people using FDR No. 150.	Similar to Alternative II.	Same as Alternative II.
	Forest Plan Visual Management System (VMS) and Visual Quality Objectives (VQO) would be used for future timber sales or other KNF management activities.	The proposed VMS VQOs would be impossible to achieve during mine life and/or VQO time frames.	Same as Alternative II.	Same as Alternative II.

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[1] For more detail, see Chapter 4.

TABLE S-3.
Summary Comparison of Potentially Significant and Significant Project Alternatives Impacts (Cont'd)

ENVIRONMENTAL ISSUE	PROJECT ALTERNATIVES			
	I (No Action)	II (ASARCO's Proposal)	III (Project With Mitigations)	IV (Modified Project With Mitigations)
		The impoundment surface could potentially never meet Retention VQO standards.	Additional reclamation requirements would increase the likelihood the impoundment surface would achieve VQO standards within several decades.	Same as Alternative III.
Scenic quality (Cont'd)		The impoundment face, mill site and utility corridor might achieve prescribed VQOs several decades after mine closure.	Additional plantings for screening, concurrent planting of trees and shrubs on impoundment face after year 7 of construction, and other additional reclamation requirements would shorten the amount of time needed for mine facilities to achieve VQO standards, but it would still take decades.	Similar to Alternative III, except that the elimination of the waste rock dump, immediate planting of the mill pad face, and the visual buffer would further help the site achieve VQO standards after several decades.
Wilderness	Current wilderness experience remains unaffected.	The ventilation adit would be highly visible and audible to recreationists using the CMW within 2,500 of the adit. The adit would significantly affect the wilderness experience of those users (see Noise above).	Placing the ventilation adit in a more vertical slope could increase its visibility, but would reduce the area of disturbance around the adit. Additional reclamation requirements would dramatically reduce the visual impacts of the adit after mine closure. Sound mitigations would reduce the noise-related impacts to humans and goats to a 100-foot radius around the adit.	Same as Alternative III. Same as Alternative III.

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[1] For more detail, see Chapter 4.

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